

1.0 Introduction

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1.1 Overview

This document is the Combined Sewer Overflow Long-Term Control Plan and Water Quality Improvement Report for the City of Indianapolis. The city initially submitted its Long-Term Control Plan (LTCP) to the Indiana Department of Environmental Management (IDEM) and the U.S. Environmental Protection Agency (U.S. EPA) on April 30, 2001. The city received comments on the 2001 plan from U.S. EPA on June 28, 2001, and from IDEM on June 28, 2002. This plan has been revised, updated and expanded to respond to the agencies' comments and requirements, as well as to include local public involvement and comment since April 2001.

The LTCP describes the control measures the city has chosen for reducing combined sewer overflows (CSOs) and improving water quality in Marion County. The document includes a discussion of regulatory requirements, existing water quality conditions, available control technologies, an evaluation of alternatives, public input on alternatives, a financial capability assessment, the long-term control plan, and a description of the city's compliance monitoring program. This section provides background information on regulatory requirements and water quality issues in Indianapolis.

The city is proposing a watershed-based plan that will protect and improve upon existing uses of our waterways, help restore beneficial uses and improve the quality of life in many Indianapolis neighborhoods. In a typical year, the plan will achieve 97 percent capture of wet-weather sewer flows on Fall Creek and 95 percent capture on other waterways, as further described in Section 7. The selected plan also is expected to reduce overflow frequency from 60 storms per year to two storms in a typical year on Fall Creek and four storms per year on other waterways, based on average annual rainfall statistics.

1.2 Combined Sewer Overflows

Combined sewer systems are found primarily in older metropolitan communities of the Northeast, Mid-Atlantic, and Great Lakes regions. Of the estimated 9,471 combined sewer outfalls nationally, approximately 85 percent are found in

these regions. In Indiana, combined sewer systems serve 105 municipalities with a combined population of 2.5 million people. Indiana's 898 combined sewer outfalls account for more than 9 percent of the national total. Indianapolis's combined sewer system serves the older parts of the city, and includes 132 overflow points that account for approximately 15 percent of the state total. Newer parts of the city are served by separate sanitary and storm sewers. The city's baseline sewer system and water quality conditions are described in more detail in Section 2 of this document.

1.3 Water Quality Impacts of CSOs

Combined sewer overflows carry raw sewage, bacteria, pathogens, industrial pollutants, oil and grease, and other contaminants into rivers and streams. These contaminants can elevate bacteria levels and reduce oxygen in the water, creating water conditions harmful to aquatic habitats, aquatic life and humans. CSOs also can carry pollutants from urban stormwater runoff, automotive fluids, household chemicals, and floating sewage and debris.

Many factors contribute to water quality concerns in Indianapolis rivers and streams. In addition to combined sewer overflows, these include stormwater runoff, failing septic systems and upstream pollution. Although a CSO long-term control plan normally is designed to address only combined sewer overflows, the city has evaluated these other factors as part of a watershed-based strategy for improving water quality. This holistic and progressive approach ensures that the city's investment will achieve the maximum improvements to water quality in the most cost-effective manner.

1.4 Regulatory Requirements

1.4.1 Water Quality and Water Body Uses

The Indiana Water Pollution Control Board has established water quality standards for Indiana waterways. These standards, which have been approved by the federal government, serve as the legal basis for permit requirements under the federal Clean Water Act. Water quality standards include "uses" designated by the state for each water body. Uses for a water body might include recreation, public water supply, industrial use, and irrigation. Water quality standards include pollution criteria to protect those uses and other policies designed to protect water quality. The state designated all Indiana waters to support both aquatic life and full body contact recreation — often referred to as "fishable and swimmable." These use designations are not attained at all times, especially when waterways are materially affected by urban and agriculture runoff.



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To meet Indiana's full body contact recreation standard, waters must meet primary contact standards, including the *E. coli* bacteria standard of 235 coliform forming units (cfu) per 100 mL of sample. This standard will be exceeded with any CSO discharge or, even if CSO discharges were eliminated, the standard is likely to be exceeded due to stormwater runoff in urban and suburban areas.

Although water quality will improve dramatically and overflows will be reduced significantly, the city will not completely eliminate sewer overflows with its selected long-term control plan because some storms inevitably will be too large for the facilities that will be built.

One of the four key provisions in U.S. EPA's National CSO policy is to review and revise, as appropriate, water quality standards. CSO communities may seek to refine water quality standards to reflect wet weather realities and to define an attainable goal for CSO receiving waters. Section 9 requests that the state refine the recreational designated use and water quality standards to reflect the attainable wet-weather uses and enable continued progress in reducing CSOs in Indianapolis.

1.4.2 Permit Requirements

CSOs are regulated under the Clean Water Act and its National Pollutant Discharge Elimination System (NPDES) program, which permits and regulates wastewater discharges. In Indiana, NPDES permits are issued by IDEM, under a delegation agreement with U.S. EPA. Both state and federal regulatory agencies have authority to enforce these permits. IDEM issued NPDES permits for both the Belmont and Southport Advanced Wastewater Treatment (AWT) plants in October 2001.

The permits' Attachment A includes requirements related to CSO discharges.¹ Attachment A requirements include, but are not limited to, the following:

- The city must report volumes and discharges from each outfall based upon a hydraulic model of the sewer system.
- The city must review, modify where necessary, and enforce its existing sewer use ordinance to meet specific requirements to reduce CSO discharges.
- The city must update and continue implementing its CSO Operational Plan.

¹The current NPDES permits are subject to an ongoing administrative appeal as of May 2006. The city has submitted permit renewal applications as of March 31, 2006.

Although Attachment A has been stayed due to the appeals, the city has voluntarily complied with its reporting, operational and sewer use ordinance requirements.

1.4.3 CSO Control Requirements

In April 1994, EPA published a CSO Control Policy (*59 Federal Register 18688*) to explain how communities and states can control CSOs and meet Clean Water Act requirements. In 1996, IDEM published a Combined Sewer Overflow Strategy to interpret the federal CSO policy under Indiana law. Both CSO policies have been supplemented by more specific guidance on various CSO-related issues. Under both state and federal policy, communities with combined sewer systems have three key responsibilities:

1. Characterize the combined sewer system and the affected streams. Characterization involves the following steps: collecting and analyzing existing data on the streams and sewer system, identifying pollution sources, reviewing existing regulations and programs, and collecting new data and information, where needed.

2. Implement nine minimum controls. These controls are measures that can reduce CSO problems without requiring significant engineering studies or major construction. They include:

- Proper operation and maintenance of the combined sewer system
- Maximum use of the collection system for storage
- Review of industrial pretreatment programs
- Maximizing flow to treatment plants
- Eliminating discharges during dry weather
- Controlling solid and floatable materials in the overflows, such as floating trash and waste
- Public notification
- Monitoring
- Pollution prevention

3. Develop a long-term control plan. A long-term control plan should consider unique conditions of the community and evaluate the cost-effectiveness of various control options and strategies. The LTCP should include monitoring and modeling activities to characterize the impact of CSOs on each stream, and target environmentally sensitive areas. The LTCP should incorporate community input in identifying sensitive areas and selecting the long-term CSO controls.



1.5 LTCP Project Approach

1.5.1 Project Team and Advisory Groups

The project team is known as the Indianapolis Clean Stream Team. The project team includes city staff in the Department of Public Works assisted by consulting firms that have expertise in water resources planning and analysis; geographic information systems and mapping; financial management; public relations; as well as design, operation, and maintenance of water and wastewater treatment facilities.

The project also incorporated input from the Raw Sewage Overflow Advisory Committee appointed by Mayor Bart Peterson and the Wet Weather Technical Advisory Committee. The two committees have been combined into the Clean Stream Team Advisory Committee, which continues to provide advice and expert assistance to the city. The advisory groups and their activities are described in more detail in Section 5 of this report.

1.5.2 Project Goals

The city's CSO control program is seeking to restore beneficial uses, protect streams from CSO discharges during periods when people are most likely to use them for recreation, and ultimately result in the city's compliance with its NPDES permits. The program is designed to employ affordable and cost-effective solutions for controlling solids and floatables; capturing "first flush" discharges; and meeting state and federal requirements for dissolved oxygen, bacteria, and other water quality parameters.

All control alternatives and strategies have been evaluated based on their ability to help achieve the goals above. However, even if the city immediately eliminated all CSOs, waterways still would not meet the state's current water quality standards for bacteria. Many streams fail to meet standards even during dry weather, when combined sewers do not overflow. Other factors cause water quality problems, such as failed septic systems, upstream pollution, urban stormwater, and sewer infrastructure problems. Therefore, the city envisions a three-pronged approach to improving water quality in Indianapolis: (1) implementing affordable and cost-effective long-term CSO controls; (2) continuing to address structural and maintenance issues; and (3) implementing watershed-based strategies for reducing non-point source pollution, such as streambank restoration, stormwater pollution prevention and converting homes on septic systems to sewer service. These watershed projects will provide tangible water quality and human health benefits.

The public has played an important role in evaluating the CSO control alternatives and the other factors contributing to water quality concerns in Indianapolis. Citizen input and the recommendations of the city's two advisory committees have been incorporated into the Long-Term Control Plan described in Section 7. The city also worked with elected officials, the Industrial Dischargers Advisory Committee and other stakeholders in preparing the plan.

1.5.3 Indianapolis Activities to Meet CSO Requirements

The city has completed the following work to fulfill the three responsibilities of CSO communities identified in Section 1.4.3. These include:

Nine Minimum Controls: In 1997 Indianapolis developed its first *CSO Operational Plan* (CSOOP) to meet the nine minimum control requirements. The city has continued to implement the CSOOP since then, including a May 2003 update to meet water quality goals and changing regulatory requirements. The CSOOP will continue to be updated periodically.

Characterize the existing system: Indianapolis prepared and implemented a Stream Reach Characterization and Evaluation Report (SRCER) in 2000, with an update in June 2003, which describes the sewer system and receiving streams. The SRCER explains:

- How the system responds to wet-weather events of various magnitudes
- The characteristics of the CSOs (where they are, how often, and with what volume and pollutant loads they discharge)
- The water quality in the receiving waters (during both dry and wet weather)
- The degree to which wet-weather water quality is driven by CSOs and other factors

Long-Term Control Plan: Section 7 of this document contains the city's long-term control plan. It identifies cost-effective control alternatives to maximize the extent that water quality standards will be attained in Indianapolis. Data used in compiling the LTCP were collected from 1948 to 2003. Of course, new data and analysis will continue to be incorporated into the city's decisions during facility planning, design and construction.



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1.5.4 Watershed-based Strategy

As noted previously, water quality in the White River basin is affected by sources other than combined sewer overflows. The long-term control plan is part of a watershed-based strategy that considers all water pollution sources and the most cost-effective means of achieving water quality goals. In addition to reducing CSOs, the city must continually implement the latest stormwater control technologies, maintain its separate sanitary sewer system, and address failing septic systems. The city's programs to address these water quality infrastructure needs are described in separate reports.

In 1998, the City of Indianapolis commissioned a Stormwater Master Plan to help identify project-by-project needs for stormwater management in Marion County. This report identified more than \$300 million in needed improvements, from maintenance activities to capital improvement projects. In 2001, the city implemented a stormwater utility under City-County Ordinance No. 43-2001. This ordinance became effective on June 6, 2001. Assessments from this ordinance began on September 6, 2001, to create the capital required to complete needed stormwater quality and drainage projects.

On February 1, 1998, IDEM issued NPDES Stormwater Discharge Permit Number INS000001 to the city. This permit was revised and renewed on October 1, 2004. Under the terms of the permit, the city has developed a Stormwater Management Program (SWMP) that now serves as the foundation for complying with the NPDES permit. The goal of the SWMP is to improve the overall water quality of stormwater runoff in the City of Indianapolis and Marion County. One of the program's objectives is to optimize stormwater system operation and maintenance practices to reduce the thousands of drainage complaints the city receives each year.

Within Marion County, an estimated 30,000 properties are served by septic systems. Septic systems are designed to filter harmful organisms and chemicals out of wastewater before they can reach rivers, lakes or groundwater supplies. However, poorly constructed or poorly maintained systems can send *E. coli* and other disease-causing organisms into the soil and water. The city's Septic Tank Elimination Program has prioritized 161 unsewered areas with approximately 18,000 homes for conversion to sewers. This program is described in more detail in Section 4.3.7. Failing or improperly functioning septic systems are the primary source of *E. coli* exceedances during dry weather, when public use of streams is mostly likely.

The city also participates in the Upper White River Watershed Alliance, Inc., a not-for-profit organization that unites local officials and staff in a 15-county region along the Upper White River.

1.6 Document Organization

This document is organized as follows:

Section 1 provides background and regulatory context for CSO and water quality issues in the city.

Section 2 describes baseline conditions, including water quality conditions, the pre-2002 wastewater collection and treatment system, how CSOs and non-CSO pollution affect water quality, and stream uses and physical characteristics.

Section 3 describes the city's analysis of available technologies for controlling CSOs and non-point source water pollution.

Section 4 describes the systemwide alternatives evaluated by Indianapolis for controlling CSOs and meeting water quality requirements.

Section 5 describes the public participation process conducted by the city to obtain citizen input into the various alternatives.

Section 6 contains a financial capability assessment of the city's ability to afford various CSO control and water quality improvement alternatives.

Section 7 describes the selected CSO control and water quality improvement plan and the schedule for project implementation.

Section 8 describes the compliance monitoring program the city will use to assess the impact of the long-term CSO controls as they are implemented.

Section 9 incorporates federal and state processes for integrating the city's level of CSO control within the state's water quality standards regulations.

